University Hospitals Plymouth NHS Trust

MATERNITY GUIDELINES

Diagnosis and management of threatened preterm labour, and prelabour premature rupture of membranes

Contents

1. Key messages:

- **Fetal fibronectin can be used from 22+0 to 33+6 weeks**
- **Use of the QUIPP app can enable more accurate risk predication**
- **Management of pregnancies from 22+0 weeks gestation is dependent upon fetal and maternal risks for ongoing neonatal survival and disability, not gestational age alone**
- **Magnesium sulphate for neuroprotection can be given as a bolus of 4g, with an infusion until delivery or for a maximum of 24 hours if undelivered.**
- **Steroids should be timed appropriately, from 8 hours following the first dose of steroids there will still be some benefit. There is no evidence of benefit if steroids are given more than 6 days prior to delivery.**
- **Steroids should be considered between 22+0 and 33+6 weeks**
- **Beyond 34 weeks, evidence for steroid benefit vs risk is lacking.**

2. Introduction

Preterm delivery (currently defined as delivery at <37 completed weeks) occurs in 8% of pregnancies in the UK, and is the most important single determinant of neonatal outcome and ongoing quality of life. This also incurs a significant cost of ongoing care to the NHS.

However, 97% of women who present in threatened preterm labour will not go on to deliver within the next 14 days. Determining the group that requires medical input, and then focussing the correct care on those women, will hopefully decrease the emotional and physical burden to patients.

This guideline aims to cover the diagnosis of preterm labour, how to identify those at greatest risk, and how to manage these women, including those who have confirmed rupture of membranes and at the extremes of viability.

3. Assessment of risk for premature delivery

Women who are complaining of symptoms suggestive of preterm labour should be offered an assessment. This includes:

- Abdominal pain
- Vaginal bleeding
- Possible rupture of membranes
- Feelings of pressure

Assessment should comprise of:

- History,
- Abdominal palpation,
- Fetal assessment (CTG if >26 weeks, auscultation if up to 25+6 weeks),
- Speculum examination
- Fetal fibronectin (FFN)
- Actim PROM if suspicion of ruptured membranes and not clinically evident on examination
- Cervical length on scan in appropriate cases

The use of the QUIPP app https://quipp.org (available online or via smart phone app) can help to risk stratify women for risk of delivering within the following 7 days, and can aid in directing management. A risk for delivery of 5% within the next seven days should be used as a cut off for intervention. This can be used with either a FFN result, a cervical length result, or both. Women with a risk of less than 5% should be assessed, and if safe, allowed home. Other indications for admission (e.g vaginal bleeding, premature rupture of membranes over-ride this test).
See appendix for use of FFN.

NOTE: contraindications to use of FFN are limited to;

- Advanced cervical dilation (>3cm)
- Rupture of membranes
- Cervical cerclage (if sited less than one week prior to test)
- Moderate or gross vaginal bleeding

4. Assessment for Premature Prelabour Rupture of membranes

This is the leakage of liquor before 37 weeks and before the onset of labour.

Women should be asked to attend for assessment if they have any concerns with regard to vaginal fluid loss.

Rupture of membranes may be diagnosed by history and examination.

A clear history of ruptured membranes should be confirmed with a speculum.

Pooling of fluid in the vagina is confirmatory. If there is doubt, an Actim PROM test should be carried out (see appendix 2 for how to carry out test). The Actim PROM has a positive predictive value of between 76 and 90%, with a negative predictive value of 96-100%.

A positive Actim PROM increases the possibility of PPROM, but care should also be focused on history. Of note, a liquor volume scan with normal liquor does not rule out PPROM.

Digital examination should not be offered routinely in cases of PPROM.

5. Management of those at high risk of premature delivery

Women who are deemed to be at high risk of premature delivery should have their case reviewed by a senior obstetrician.

All women should have bloods for CRP, FBC, group and save and vaginal swab for MC+S taken.

Women who are having active management should have magnesium sulphate and fetal monitoring. For those women contracting this should involve continuous fetal monitoring. For women who are not contracting, the timing and form of fetal monitoring will be individualised.

Steroids should be given if delivery within the next 24-48 hours is considered likely. The second dose can be withheld if delivery in the next few days appears less likely.

Once in established labour all women require IV antibiotics for GBS cover.

Document the administration of MGSO4 and steroids on the PRECEPT sticker and place in the notes.

If possible, women should have a tour of the neonatal unit to become more familiar with the environment.

5a. **Women whose pregnancies are 22+0 – 26+6 weeks gestation**

Women whose pregnancies are <26 weeks must be reviewed by a consultant or post CCT fellow, and a senior neonatologist, to discuss the risks to the fetus, and confirm a plan for ongoing management in consideration of the latest BAPM guidance. (See appendix 3)

Negative indicators for neonatal survival include chorioamnionitis, oligohydramnios, breech position, fetal growth restriction and male gender.

For women who are being transferred to the trust, discussion should take place between the obstetric, neonatal and home hospital teams prior to accepting the patient. Please see intra-uterine transfer guideline.

Discussion should include chances of survival for the fetus, both with and without disability, and what we mean by disability. It should also include maternal risks and consequence of interventions, such as CTG and operative delivery. The changing picture as time goes by, both positively and negatively, should be discussed

If the decision is to offer active management for the fetus once delivered, discussion must also include whether caesarean section would be offered in the case of fetal compromise and the benefits and risks of this.

All discussions should be fully documented and updated as required.

A scan by a fetal medicine specialist may be useful to determine fetal weight etc., if one is available.

5b. **Women at 27 – 33+6 weeks gestation**

The outcome for these fetuses is good, and so active management is advised. CTG monitoring is useful, and can be used to guide delivery.

Magnesium sulphate should be given with at least the loading dose received prior to delivery. There is no requirement to delay delivery for a maintenance dose. Once given does not have to be repeated until 7 days later.

Steroids should be given (12-24 hours apart), and should be given even if delivery is thought to be imminent, as they may still have an effect. Tocolysis may be considered if not contraindicated. If delivery is not expected within the next 7 days, steroids should be withheld until delivery is more likely.

Vaginal delivery is still the preferred route (the evidence for caesarean for breech in this group is not good, with a risk of head entrapment of 10% in vaginal breech delivery) however, this may be required for signs of fetal compromise or complicated fetal lie. This should only occur once in established labour if for fetal lie.

5c. **Women at 34 – 36+6 weeks gestation.**

Labour should not be delayed to administer steroids. The evidence for steroids beyond 34 completed weeks is conflicting, and requires further evaluation before the benefits can be said to outweigh the risks to both the mother and the fetus. These risks are of hypoglycaemia, weight restriction (if the fetus doesn't deliver) and hyperglycaemia in the mother. The benefits reported to the fetus for respiratory outcomes are a composite of Transient tachypnoea of the newborn (TTN), bronchopulmonary dysplasia (BPD) and respiratory distress syndrome, with the majority being TTN and BPD. The cost -benefit analysis is also not in favour of steroids in this group.

Magnesium sulphate is not thought to be of benefit in this group.

Continuous monitoring in labour is recommended, again with vaginal delivery being preferred. LSCS should be offered for routine obstetric indications.

6. Management of Pre-term Pre-labour rupture of membranes

All women should have baseline bloods for FBC and CRP, and a vaginal swab for MC+S taken.

All women should be started on appropriate antibiotics (Erythromycin 250mg QDS for 10 days)

An ultrasound scan to determine fetal lie, placental site and liquor volume should be performed on triage / labour ward.

In the absence of chorioamnionitis, delivery should be planned for 37 weeks gestation. The presence of GBS does not require delivery prior to 34 weeks gestation. After 34 weeks delivery may be considered.

6a. **Women whose pregnancies are 22+0 – 26+6 weeks gestation**

These women should be reviewed by a senior obstetrician (Consultant or post CCT fellow) at the earliest opportunity. Discussion of the risks of infection, premature delivery, and effect of oligohydramnios should take place. A senior neonatologist should also see the patient and be involved in discussions around ongoing care.

For women who are being transferred to the Trust, discussion should take place between the obstetric, neonatal and home hospital teams prior to accepting the patient. Please see intra-uterine transfer guideline.

To assist with this discussion women in this group should be assessed by a fetal medicine practitioner at the earliest practical opportunity.

Magnesium sulphate can be given (and repeated as required)

Aim to time steroids as close to delivery as possible, as repeated doses increases the risks of cerebral palsy. The steroid effect on fetal lung maturity is also lost after 6 days. If labour is suspected, steroids should be given.

A plan for admission, and ongoing management, including indications for delivery should be made and fully documented in the notes. Caesarean section would normally not be indicated in these women.

6b. Women at 27 – 33+6 weeks gestation

These women should be reviewed by a senior obstetrician (ST3 or above) at the earliest opportunity. Discuss risks of infection, premature delivery. Discuss with neonatology and offer tour of unit. Consultant or post CCT fellow review should occur at the earliest practical opportunity.

Baseline scan for growth and liquor can be performed as a departmental scan.

Magnesium sulphate can be considered up to 34 weeks gestation.

Aim to time steroids as close to delivery as possible, to avoid repeat doses as this increases the risks of cerebral palsy. The steroid effect on fetal lung maturity is also lost after 6 days. If active labour is suspected, steroids should be given if they have not been given before

A plan for admission, and ongoing management, including indications for delivery should be made and fully documented in the notes. Caesarean section would normally not be indicated in these women if the fetus is cephalic.

7. Medication regimes

7a. Magnesium Sulphate

Aim to give within 4 hours of delivery. Loading doses can be repeated. Effect of magnesium can last up to 6 days, however it should also be given if delivery is imminent and it has been more than 24 hours since the last dose.

Loading dose: 4g $MgSO_4$ as a SLOW BOLUS over 15 minutes

- Draw up 8ml of 50% $MgSO_4$ solution (4g) followed by 12ml of 0.9% saline into a 50ml syringe
- Mix well
- This will give a total volume of 20ml
- Place the syringe in a syringe driver and run it at 80mls / hr
- The IV infusion will then run over 15 minutes

Maintenance dose: 1g/hr

- Draw up 10ml of 50% $MgSO_4$ solution (5g) followed by 40ml of 0.9% saline into a 50ml syringe
- This will give a total volume of 50ml

- Place the syringe into a syringe driver and run at 10ml/hr

The maintenance infusion should be continued for 24 hours or until delivery (whichever is sooner). It does not need to be continued postnatally (unlike in pre-eclampsia).

Women should have their observations recorded on a MOEWS chart hourly during the infusion, including reflexes. A strict fluid balance chart should be completed.
Signs of magnesium toxicity are oliguria, respiratory depression or supressed/absent reflexes.
Stop the infusion and call for medical review if this occurs.
Resuscitation and ventilator support should be immediately available if needed during administration of $MgSO_4$.

NOTE: Magnesium toxicity is less likely with normal renal function or the loading dose alone.

Overdose is treated with 10ml of 10% Calcium Gluconate IV over 10 minutes

Women should be advised that they may experience minor side effects such as flushing, nausea and vomiting, sweating and injection site problems. These adverse effects should not prompt discontinuation of the medication.

7b. Corticosteroids

Betamethasone or Dexamethasone should be given for the following groups of women:

- Those between 22+0 and 33+6 weeks gestation if at high risk of delivery within the next 7 days

Antenatal corticosteroid administration can impair diabetic control; See diabetes in pregnancy guideline.

Dose and Administration:

Two doses of Betamethasone 12 mg intramuscularly 24 hours apart If unavailable Dexamethasone 12mg is an acceptable alternative

Repeat doses of corticosteroids should not be routinely offered.

7c. Tocolysis

Take the following factors into account when making a decision about whether to start tocolysis:

- Whether the woman is in suspected or diagnosed preterm labour between 22 weeks gestation and 33+6 weeks gestation with intact membranes

- Availability of neonatal care or the need to transfer to another unit (Please see intra-uterine transfer guideline)

- Other clinical features that may suggest that stopping labour is contraindicated, such as:
  - Evidence of fetal compromise
  - Intrauterine infection
  - Antepartum haemorrhage
  - Any maternal or fetal condition that warrants delivery (e.g. pre-eclampsia)
  - Any maternal medical disorder where chosen tocolytic drug is contra indicated (see below)

7.c.1 Nifedipine

Oral Nifedipine modified release (tablets) 20mg should be administered as an initial dose, followed by doses of 10-20mg modified release tablets 3-4 times daily according to uterine activity. This should be continued for a maximum of 48 hours. A total dose daily of 60 mg and above has been associated with adverse side effects such as headache and hypotension and should therefore be considered carefully.

The Nifedipine must be discontinued once the patient is in active labour and the MgSO4 has been commenced.

Where Nifedipine is contraindicated Atosiban is an acceptable alternative.

7.c.2 Atosiban

1. **Loading dose:**

Withdraw 10mls from a 100ml Normal Saline infusion bag (keep infusion bag to one side for use with initial infusion – see step 2). Draw up 0.9mls Atosiban (6.75mg) in a 1ml syringe (**small vial** containing 0.9ml of 7.5mg/ml solution of Atosiban for injection). Add to the syringe containing 10mls of N/Saline. Administer IV as slow bolus injection over minimum time of one minute (may cause nausea if given more quickly).

2. **Initial infusion:**

A high dose infusion of 300 micrograms/min of Atosiban for 3 hours only.

Preparation: Using the Normal Saline infusion bag from Step 1 (with 10mls already removed) add 10mls of Atosiban 7.5mg/ml concentrate (using two 5ml vials). Commence infusion using a Baxter infusion pump set at an initial **rate of 24mls/hr** and the **total volume to be infused set to 72mls**. (This will ensure that the pump alarms after 3 hours, so that the rate can then be reduced – see Step 3)

3**Maintenance infusion:**

A low dose infusion of 100 micrograms/min Atosiban for up to 45hrs; stop earlier once contractions settle for 4 hours. Most patients are expected to settle in 13 hours.

Preparation: **Reduce infusion rate of initial infusion to 8mls/hr** (there will only be 28mls left in this bag, so set total volume to be infused at 28mls). When the next bag of the maintenance infusion is required, make up as for Step 2 and commence infusion at 8mls/hr, with total volume to be infused at 100mls.

Monitoring for first 3 hours: Half hourly recordings of pulse, B/P and frequency/strength of contractions, hourly temperature and continuous CTG. Frequency of subsequent observations will be decided following review by the obstetric registrar.

Appendix A:

Fetal fibronectin testing

Before performing test see indications / contraindications and fetal fibronectin flowchart

- During speculum examination, lightly rotate the supplied swab across the posterior fornix of the vagina for 10 seconds to absorb cervicovaginal secretions (do not saturate the tip as this may invalidate the test).

- Remove swab and immerse tip in buffer solution and gently mix the swab in the buffer solution and remove if the test is to be performed immediately.

  Note: *Refer to transportation and storage notes if test is to be performed at a later time (found in CDS sluice).*

Using fetal fibronectin analyser

- Select Test Patient (1) on Main Menu
- Enter user ID (user initials)
- Enter lot no.
- Enter patient ID
- Insert the Rapid FFN Cassette and press Enter
- Pipette 200µL from the sample collected in the buffer solution into the well of a rapid FFN cassette and press Enter

A result with a quantification will be printed within 15 minutes, which must be placed in the patients notes.

Enter this value into the Quipp app to determine risk of delivery within next 7 days.

Appendix B –

Actim PROM testing (no limit of viability)

Actim® PROM test kit contains all necessary materials and can be stored at:

- Room temperature: 2–25 °C
- Up to 30 °C for 2 months

How to use Actim PROM:

- **Collect sample with or without speculum**

Hold the swab in vagina for 10-15 seconds.

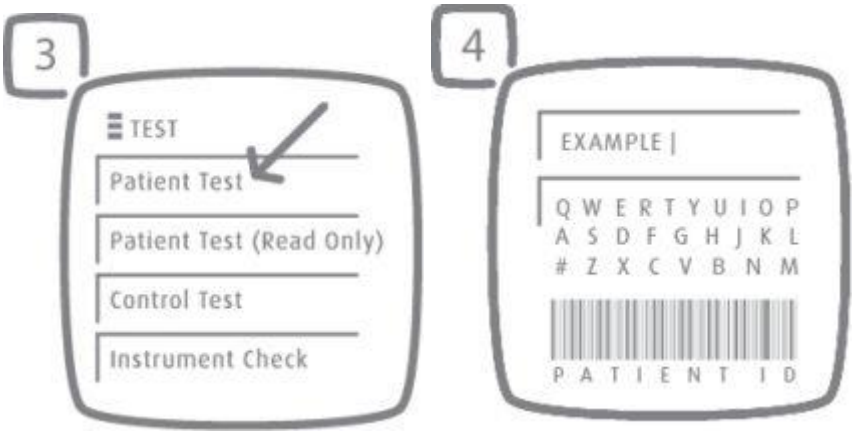
- **Extract specimen**

Place the swab in the Specimen Extraction Solution, swirl around vigorously for 10-15 seconds, and discard the swab.

- Prepare the instrument

Log into the instrument. Select ”Test” icon and select “Patient test” icon.

Enter patient ID either manually or with a barcode reader.



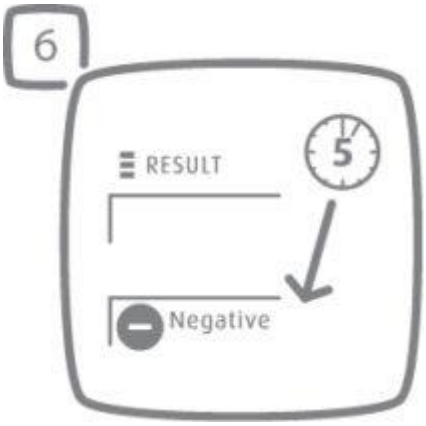
Activate the test and start the procedure

Place the yellow dip area of the test into the extracted sample and hold it there until you see the liquid front enter the result area.

Remove the dipstick from the solution, place it in the cartridge, and insert the cartridge inside the Actim 1ngeni.

- Interpret test results

Positive and negative results are shown on the screen.



Appendix C:

BAPM framework - the management of very preterm birth

This is a framework rather than a set of rules to guide care for those women presenting between 22 and 26+5 weeks gestation with PPROM / Preterm labour.

It addresses the likely survival of the baby dependent on various positive or negative factors. This may then go on to influence the care than the obstetric and neonatal teams would offer the mother and the baby.

Factors that improve survival are:

Gestational age
Female gender
Normal fetal weight
Cephalic presentation
Singleton pregnancy
Steroids
Magnesium sulphate

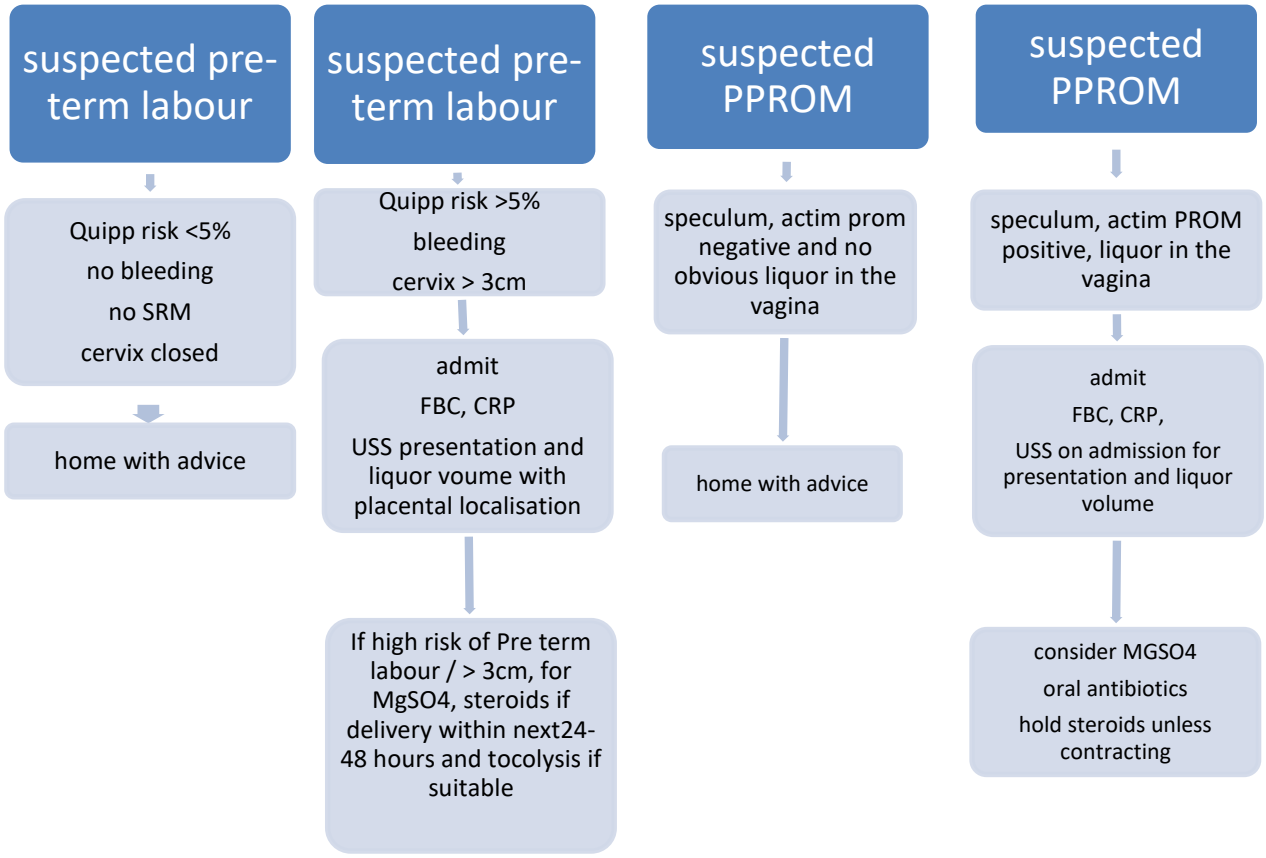
Factors that decrease survival are:

Lower gestational age
Male gender
Multiple pregnancy
Chorioamnionitis
Fetal growth restriction
Fetal anomaly
No steroids
No magnesium sulphate

These factors are all taken into account in the counselling from the neonatal and obstetric teams, as well as the risks to the mother of different forms of delivery and timing of delivery.

Appendix D:

Basic flow chart for assessment and triage:



Monitoring and Audit

Auditable standards:
use of Quipp app to determine risk of preterm labour and delivery within 7 days
steroid to delivery interval
use of magnesium sulphate within 6 days prior to delivery less than 34 weeks
Use of tocolysis in high risk patients
Rolling audit of deliveries 22-26 weeks gestation

Reports to:
Clinical Effectiveness Committee – responsible for action plan and implementation of recommendations from audit

Frequency of audit: Annual

Responsible person:

Cross references

Maternity Hand Held Notes, Hospital Records and Record Keeping:
http://staffnet.plymouth.nhs.uk/Portals/1/Documents/Clinical%20Guidelines/Maternity/Maternity%20hand%20held%20notes%20and%20hospital%20records.pdf?timestamp=1538986494694

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RCOG green top guideline No36, Group B Streptococcol disease, early onset, 2017

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Work Address	Maternity Unit, Derriford Hospital, Plymouth, Devon, PL6 8DH		
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Changes	Change to steroid timing Change to quantified fetal fibronectin Change to using Quipp app for risk of pre-term delivery Change to definition of potentially viable pregnancy to 22 weeks Change to magnesium sulphate regime		
Date Ratified	Feb 2021	Valid Until Date	April 2023